osteotomy. Subsequently mid-face advancement may be required in patients with the Crouzon syndrome and in some patients with the Apert syndrome.

Premature closure of the sagittal suture, which is rarely associated with orbital and facial deformities, has been satisfactorily treated for many years with strip craniectomy. A new method for treating this abnormality has been described by Jane and offers immediate correction of the deformity by reducing the anteroposterior diameter and increasing the transverse diameter.

In North America there are several craniofacial centers where the craniofacial team consists of a plastic surgeon, a neurosurgeon, a pediatrician, an ophthalmologist, an orthodontist, and other specialists who continue to refine and improve the treatment for severe craniofacial anomalies. Cosmetic results have been particularly rewarding in patients who have orbital hypertelorism and the less complicated craniofacial clefts.

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Neurosurgical Aspects of Congenital Lumbar Spondylolisthesis

IN A TYPICAL PATIENT suffering with backaches from congenital lumbar spondylolisthesis, no neurological deficits are found on clinical examination. However, in a few patients neurological signs are present due to disc changes occurring most often at the level above the site of the spondylolisthesis. Lumbar spondylolisthesis is most frequent at the lumbosacral level and, in these patients, disc protrusions occur most often at the next higher level, L4-5, rather than at the site of the spondylolisthesis. These patients show more significant neurological changes than the average L4-5 disc protrusion patient. Extensor weakness of the foot of some degree will occur in 70 percent of the patients (40 percent having a complete foot drop and 30 percent a partial foot drop).

The explanation for the high incidence of foot extensor weakness is due possibly to three factors: (1) The fifth lumbar nerve root sometimes becomes entrapped due to entanglement in fibrous tissue along the side of the vertebra. A ligamentous band runs from the undersurface of the transverse process to the site of the vertebral body and, with the forward slippage and downward descent of the 5th lumbar vertebra, the ligament comes down on the L-5 root and may entrap it against the sacrum. (2) The forward slippage and degenerative disc changes can cause the intervertebral disc to bulge out around the periphery of the vertebral body, just like squashed putty, burying the nerve root in this bulging mass after it has emerged from the foramen. (3) A third method of producing nerve root pressure occurs when the vertebral body glides forward and downward along the inclined plane of the superior surface of the vertebral body below. With this movement, the pedicles descend on the nerve root and cause kinking as it emerges through the foramen.

In patients with spondylolisthesis and neurological deficits myelographic examination is required and will usually show complete myelographic blocks or significant nerve root deformities. Orthopedic surgeons favor spinal fusion when nonsurgical methods are not successful. Surgical therapy is most commonly used in teenagers and young adults, and rarely in the older patients. The combination of spondylolisthesis and disc protrusions, however, involves an older patient population, which usually responds successfully to simple disc excision without concomitant fusion.

The occurrence of disc protrusion in a series of patients with spondylolisthesis has been reported as 12 per 100 cases of spondylolisthesis, 2 having disc problems at the spondylolisthesis site and 10 at other intervertebral level.

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Acoustic Tumors

IN THE PAST TWO DECADES tremendous advances have made it possible for all physicians to recognize acoustic (schwannomas) tumors of the cerebellopontine angle without the symptoms and findings provided in classic models of this disorder.

Physicians should not wait for any or all of the symptoms of headache, nausea, vomiting or staggering gait and such findings as papilledema, facial numbness, facial palsy or ataxia to appear before being alerted to the possibility of this usually be-

nign and curable intracranial tumor. When these findings or symptoms are present the tumor has usually reached massive proportions and cannot be removed without considerable risk. This is probably related to the very slow or stuttering nature of the growth process which permits the adjacent central nervous system structures to adapt or mold without alteration in function to the slow distortion caused by the tumor.

Therefore studies should be carried out in all patients who complain of unilateral hearing loss. While highly sophisticated neurootologic test facilities are not universally available, the always accessible telephone is a superb simple screening test for detection of sensory neural hearing disorders. Frequently an early clue is provided by the simple comparison of speech perception between the right and left ear.

Telephones provide simultaneous bone and air conduction as well as an index of speech perception. Disorders of speech perception are prominent indicators of sensory-neural hearing loss or conduction impairment in the 8th nerve, the most common early finding in acoustic tumors.

Contemporary microneurosurgical techniques now make possible total tumor removal with preservation of the 7th nerve in many cases and, in an ever-increasing number of cases, preservation of the cochlear division with useful hearing.

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Galactorrhea, Amenorrhea: An Algorithm

AN INCREASING NUMBER of patients with the syndrome complex of amenorrhea/galactorrhea are presenting to clinicians for further investigation. The development of a reliable immunoassay to assess the serum level of prolactin has enabled a greater understanding of the physiologic basis underlying this disorder in many patients. Once the diagnosis of hyperprolactinemia has been established one must pursue the potential underlying causes for this hormonal aberration. A detailed history will identify use of any of a number of pharmacological agents that may be responsible for this syndrome.

The most common cause of hyperprolactinemia relates to the use of oral contraceptives. If a patient has recently stopped using oral contraceptives or if galactorrhea develops during oral contraceptive use, withdrawal of the medication will generally result in resolution of the hyperprolactinemia within a period of two to three months. One must also consider a number of other pharmacological agents, including tranquilizers of the phenothiazine group and antidepressants. In general, discontinuation of these agents will result in resolution of the hyperprolactinemia.

If the hyperprolactinemia should persist or appears unrelated to any pharmacological agents, then one must consider a primary pituitary disorder as the underlying source. Prolactin levels in excess of 100 ng per ml are highly suggestive of a primary pituitary tumor as the underlying cause. The best subsequent test to evaluate the potential presence of a pituitary tumor is multidirectional or hypocycloidal polytomography, which will allow clear delineation of any deformation of the sella turcica. This study enables specific evaluation of distortion of the sella turcica by small intrasellar lesions. Upward projection of an intrasellar or suprasellar lesion (or both) is best evaluated by computerized tomographic scanning utilizing multiple overlapping cuts of the sella turcica and suprasellar cistern. Fractional pneumoencephalography or metrizamide cisternography may be desirable in equivocal cases. Clinical evidence for suprasellar extension may also be found by an in-depth evaluation of the visual axis using tangent screen visual field examination along with visual evoked response evaluation.

If these studies fail to show evidence of an intrasellar or suprasellar lesion, then administration of bromergocryptine will result frequently in resolution of the hyperprolactinemia and galactorrhea, with restitution of normal menses and fertility. This agent is not curative but is highly effective in suppressing the aberrant hormonal function.

If, on the other hand, evidence is obtained indicating the presence of a pituitary tumor, then transsphenoidal resection of the pituitary tumor has proved, within the past ten years, to be the most effective way to deal with this problem. This technique provides a mechanism for removal of the hyperfunctioning tumor under microscopic dissection while preserving normal adenohypophyseal and neurohypophyseal function.

Depending upon the underlying pathophysiologic process, excellent methods are available to